Decision Near on Cleanup of Unexploded Ordnance at Fort Ord

Directorate of Environmental and Natural Resources Management

October 2001

Community Bulletin #2

New Studies Evaluate Alternative Vegetation Clearance Methods

Para obtener una copia completa del boletin de la comunidad #2, contacte (800) 852-9699.

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Some key points from Community Bulletin #1

- The Army must clean up explosives before the land can be safely reused by the community. Highly explosive items cannot be safely removed unless the vegetation is first cleared so workers can see the ground where they are working.

- The Army has used a variety of techniques to remove brush, including prescribed burns. In 1998 the Army voluntarily halted the prescribed burn program following a lawsuit by the Monterey Bay Unified Air Pollution Control District claiming jurisdiction over prescribed burns at Fort Ord, coupled with regulatory concerns expressed by the U.S. Environmental Protection Agency (EPA) and the California Department of Toxic Substances Control (DTSC). Also, some nearby residents with respiratory conditions and other concerns oppose burns and fear that the smoke contains dangerous chemicals.

- The Army has identified three areas—known as Ranges 43-48, Range 30A, and OE 16—that have high priority for cleanup. These areas were identified because the unexploded explosives on this land are very dangerous and very sensitive. In addition, these areas are close to populated areas, or roads that provide access to these areas, and there is evidence of prior trespassing.

- The land that has been identified as high priority for cleanup will largely remain as natural habitat after cleanup—the primary purpose of cleanup at the priority sites is public safety, not economic development.

- The public can attend a symposium discussing the Army's studies on November 14th and will be invited to make comments during meetings in March 2002.

Continued on page 4

Key Studies Completed...Now Possible to Evaluate Alternatives

This is the second community bulletin from the Fort Ord Cleanup Program about an upcoming decision on how to clear brush from land at the former Fort Ord. The brush needs to be cleared before the Army can safely remove ordnance and explosives left over from the days when this land was used to train soldiers to fire guns, artillery, grenades and rockets. Some dangerous unexploded explosives remain on this land.

Community Bulletin #1 discussed: why the explosives need to be cleaned up, why brush needs to be cleared before explosives can be removed, why the U.S. Fish & Wildlife Service supports prescribed burns, how the land will be used after it is cleared, and what vegetation clearance methods are being studied. A summary of Community Bulletin #1 begins on the left. For a copy of Bulletin #1 please see www.FortOrdCleanup.com, or phone (800) 852-9699.

Community Bulletin #1 left several unanswered questions:

- How effective are each of the alternatives?
- What are the impacts of each of the alternatives?
- Would prescribed burns on lands where there are explosives produce air emissions that are more dangerous than normal agricultural or wildland prescribed burns?
- How would the Army alert the public about burns and relocate people who want to be out of the area during any burns?

The Army recently published a draft version of a major environmental document called an Interim Action Remedial Investigation/Feasibility Study that answers these questions for three areas on the former Fort Ord. The Army has identified these three areas—known as Ranges 43-48, Range 30A, and OE 16—as high priority for cleanup because of the dangerous nature of the explosives remaining on this land. These former artillery training ranges are also near residences and schools, and there is a history of people trespassing on these lands, at considerable personal risk. The Army has recently installed concertina wire around much of this property to reinforce the existing four-strand barbed-wire fence. But the experience at Fort Ord and other military installations is that fences alone cannot prevent trespassing.

The Interim Action Remedial Investigation/Feasibility Study describes the vegetation clearance alternatives and the results of their evaluation. It also evaluated alternatives for conducting detonations of unexploded ordnance and explosives, and evaluated methods for reducing the explosive risks to the public.

In March 2002, the Army will publish its proposed plan for how it will clear vegetation on each of the three sites. This plan will also describe methods for reducing the explosives risk to the public, including how detonations of unexploded ordnance and explosives will be handled. The public will be given the opportunity to comment on the proposed plan before a final decision is made.

How You Can Be Involved

This bulletin is the second of four that you will be receiving by mail. The contents of the bulletins are being reviewed by a number of experts and agencies in an effort to make them as objective as possible. The Army has published a draft version of the Interim Action Remedial Investigation/Feasibility Study. You can download this document at www.FortOrdCleanup.com, or request a copy by mail.

On November 14, 2001 there will be a symposium at which technical experts will provide briefings on the topics covered by this newsletter and provide a chance for people from the community to ask questions. This symposium is targeted specifically to local elected officials and staff from local agencies and governments—which is why it is scheduled during the day, instead of in the evening—and the public is invited to attend.

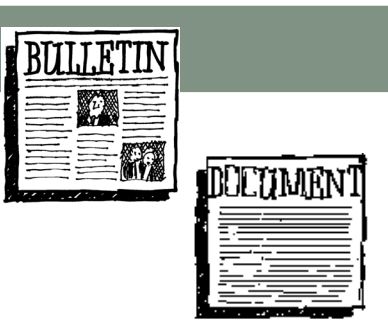
In March 2002, the Army will publish its Interim Action Proposed Plan. Community Bulletin #3 will be mailed to the public at about the same time, and will summarize the Proposed Plan and announce opportunities for the public to comment on the plan. Public meetings will be held at several locations throughout the area.

After evaluating the public comment, the Army and the two regulatory agencies—the U.S. Environmental Protection Agency and the California Department of Toxic Substances Control—will make a decision that will be documented in a Record of Decision. The decision, and the reasons for the decision, will also be announced in Community Bulletin #4, along with any actions the Army will take to minimize impacts on the public as a result of its decision.

Community Outreach Schedule

Fort Ord Vegetation Clearance Alternatives

OCTOBER 2001



Community Bulletin #2

Draft IA RI/FS Released

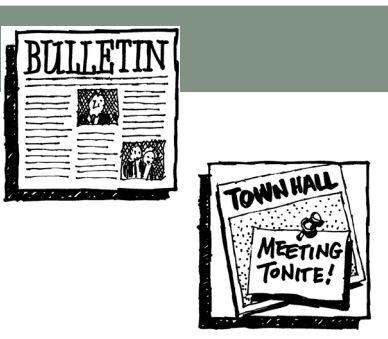
NOVEMBER 2001

Symposium #2

MARCH 2002

Interim Action Proposed Plan is Released

MARCH/APRIL 2002



Community Bulletin #3

Public Comment Meetings

SEPTEMBER 2002

Community Bulletin #4

Record of Decision Signed

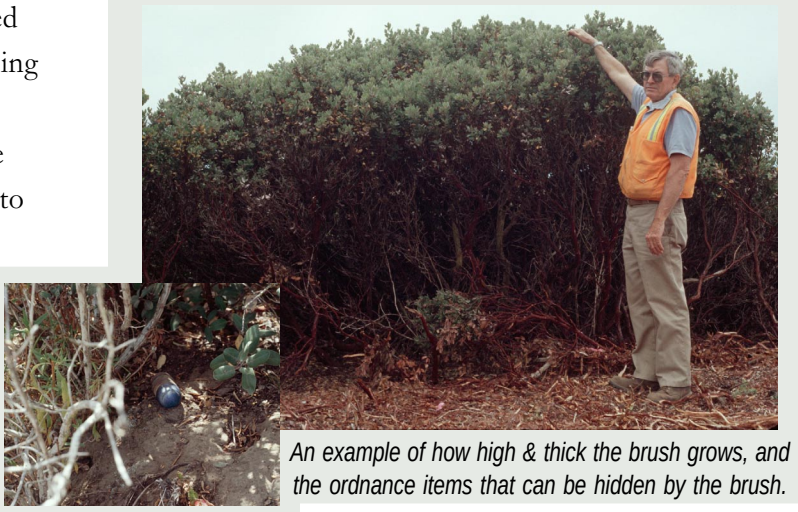
Key Points from Bulletin #1 (continued)

- More than 8,000 acres of land where there may be unexploded ordnance and explosives is covered by Central Maritime Chaparral (a rare habitat).
- When Central Maritime Chaparral is cleared by fire it is actually good for the natural habitat. When it is cleared by hand or mechanical means, this rare habitat doesn't fully recover.
- Because of this, the Army and the U.S. Fish & Wildlife Service (the agency responsible for protecting rare and endangered species) have had an agreement since 1994 to use prescribed burns as the primary method for brush clearance on lands designated as habitat reserves and containing Central Maritime Chaparral.
- Since the Army has not been using prescribed burns for several years, and in order to remain in compliance with the Endangered Species Act, the Army and the Fish & Wildlife Service have agreed that there will be no further cutting of Central Maritime Chaparral habitat except in some areas that are intended for development. No new land transfers to the community (other than those already agreed upon) will occur until the prescribed burn issue is resolved.

Evaluation of Vegetation Clearance Methods

Why Does the Brush Need to Be Cleared?

The explosives on these high-priority cleanup areas are very sensitive and they can be triggered if accidentally bumped or even by people stepping over them. If they explode, they could kill or injure workers in the immediate area. To reduce the danger, explosives cleanup specialists need to see the ground where they are walking so they don't accidentally trigger an explosion. They also need to be able to operate explosives-detection equipment to sense where explosives are located. Brush must be no higher than 6 inches tall, and leaves, twigs, and other debris must be cleared sufficiently so that workers can see the surface of the ground.



An example of how high & thick the brush grows, and the ordnance items that can be hidden by the brush.

What Vegetation Clearance Methods Were Studied?

The Army conducted an evaluation of alternative vegetation clearance methods for Ranges 43-48, Range 30A, and OE 16, the parcels of land that are the highest priority for cleanup. The first step in evaluating vegetation clearance methods was to identify the types of vegetation growing on these lands. The Army also identified the types of explosives likely to be found on these lands based on the kind of training that occurred there historically and actual inspection of "sample" areas where it was safe to work. The Army then evaluated how each alternative vegetation clearance method would work, what staff resources would be needed, how long clearance would take, how effective each method would be in clearing the brush, and what it would cost to complete the work on the high priority areas.

Here are the alternatives that were evaluated:

The "No-Action" Alternative

In the "No Action" alternative the Army would not clean up the explosives. The land would be fenced off and could not be used for any public purposes. The Army is required by the regulations that govern the cleanup to consider the "No-Action" alternative.

Manual, Mechanical, and Remotely-Operated Clearance

These methods are listed together because all of them involve physically cutting the vegetation.

Manual clearing involves cutting and clearing vegetation using motorized chainsaws, power chippers, mowers, weed eaters and non-motorized hand tools such as clippers and loppers. Smaller shrubs would be cut and carried to an area where they would be disposed of by chipping or removal. Workers must enter the high-explosives area on foot to do the work.

Mechanical clearing involves cutting the brush using manually-operated equipment that is pulled by a tractor, or other kinds of equipment on tracks.

Remotely-operated equipment includes machines that are designed to cut vegetation under the control of operators who do not actually enter the area where the work is being done. In some cases, operators watch the work being performed using a remote video camera. Some of these machines are designed only to clear vegetation. Others are designed primarily for mine-clearing but could be outfitted with tools for vegetation clearing.

Prescribed Burns

Fire management specialists start carefully-controlled fires to burn off the brush. Burning occurs under specified climatic conditions, and with appropriate manpower and equipment to ignite, manage, and contain the fire. [A more detailed description of how a burn would be managed is provided on page 12.]

Animal Grazing

As many as 350 goats would be penned in an electrically-fenced area and allowed to graze. They would consume all the palatable vegetation within reach. Workers would have to enter the high-explosives area regularly to move the fences, and to provide water. A small number of goat-herders and dogs managing the flock would also have to work in the high-explosives area.

Herbicide Application

Herbicides would be applied from the air, (e.g. by helicopter), to the areas that need to be cleared. Herbicides would remove the canopy of leaves and prevent future growth.

How Were The Alternatives Evaluated?

The Army is following a two-step process in evaluating the alternatives. The first step was to consider each of the alternatives listed above and "screen out" those alternatives that are clearly not effective or feasible. The remaining alternatives will then be given a more detailed analysis, as discussed in more detail below.

The Army used three primary criteria during the "screening" process:

1) Effectiveness 2) Implementability 3) Cost

Effectiveness

The term "effectiveness" includes a number of components:

Clearance to Bare Ground

A key measure of effectiveness is whether, once the work has been done, vegetation has been cleared to bare ground or no more than 6 inches above the ground, and is sufficiently clear of leaves, twigs, and other debris so workers can see the ground.

Protective of Public Health and the Community

This criterion takes into consideration noise, dust, emissions, safety distance from detonations, and site security during vegetation clearance work.

Protective of Workers During Implementation

This criterion considers the risks of injury or death to cleanup workers from exposure to accidental detonations.

Protection of the Environment

Each clearance method was evaluated for its impact upon the environment including rare and endangered species, air and water quality, and erosion.

Compliance with Applicable or Relevant and Appropriate Requirements (ARARs)

There are numerous federal and state environmental rules and regulations with which the Army must comply. These are referred to in federal cleanup law as ARARs—Applicable or Relevant and Appropriate Requirements. The agencies are in the process of finalizing the list of ARARs that will apply to vegetation clearance. The box at the right shows requirements that are likely to be considered.

Implementability

This includes such considerations as:

- The time and resources required to complete the work.
- The Army's ability to comply with regulatory requirements.
- Whether the needed tools, equipment, and staffing would be available to employ each clearance method.

Cost

Estimates were developed for how much each method would cost to implement. These estimates are still preliminary, and the final estimates could be as much as 30% (plus or minus).

What is Substantive Compliance?

In 1998, the Monterey Bay Unified Air Pollution Control District filed a lawsuit claiming jurisdiction over Fort Ord burns, but recently a federal judge ruled that the District does not have jurisdiction. This means the Army will not file for or participate in formal District permitting processes. However, federal cleanup law requires the Army to comply with the substantive elements of ARARs (for example, meeting air quality standards), even if no permit is obtained.

A sample list of Applicable or Relevant and Appropriate Requirements (ARARs) that could apply

- Federal Resource Conservation and Recovery Act, Subpart M (Military Munitions Rule)
- Federal and California Endangered Species Act
- Federal Hazardous Materials and Transportation Act
- California smoke management program guidelines (prescribed burns only)
- National Historic and Archaeological Preservation Acts

Another standard that might be considered:

- Department of Defense Ammunition and Explosives Safety Standards, Safety Practices and Disposal

How Well Did Each Method Satisfy The Criteria?

The following table provides a summary of how well each clearance method did in satisfying these criteria.

Alternative Method	Effectiveness					Implementability	Approx. Cost *
	Clearance to Bare Ground	Protection of Public Health & the Community	Protection of Workers During Implementation	Protection of the Environment	Compliance with ARARs		
No Action	No vegetation clearance—considered as a baseline.	High explosive materials would remain on land—high risks to anyone who enters the land.	No implementation. In the event of future fires, firefighters could not enter the area to control fires.	U.S. Fish & Wildlife Service says this habitat needs periodic burning for its ecological health.	Failure to comply with numerous laws requiring cleanup of the site.	No action would be taken to clear the vegetation.	No initial costs; however, there would be continuing operations and maintenance costs ($1,350/acre) to inspect and repair existing fencing, conduct patrols and replace signs as needed.
Manual Cutting	Vegetation could be cut to required length.	Insignificant air emissions, noise, or dust.	Workers would have to enter areas with high explosives. Danger that workers may trigger unexploded ordnance causing injury or death.	Poor recovery of rare and endangered species habitat.	Violation of Habitat Management Plan and Endangered Species Act.	Would take from 8-10 months to clear ranges. Probably could not be implemented because of failure to comply with Endangered Species Act.	$12,900/acre
Mechanical Cutting	Vegetation could be cut to required length.	Insignificant air emissions, noise, or dust.	Workers would have to enter high explosives areas. Danger that workers may trigger unexploded ordnance causing injury or death.	Poor recovery of rare and endangered species habitat.	Violation of Habitat Management Plan and Endangered Species Act.	Would take from 8-10 months to clear ranges. Probably could not be implemented because of failure to comply with Endangered Species Act.	$3,200/acre
Remote Cutting	Remote operated equipment has not been used in similar conditions.	Insignificant air emissions, noise or dust.	High probability that equipment will be damaged by explosives. Workers would then have to enter high explosives areas to retrieve and repair equipment—resulting in danger that workers may trigger unexploded ordnance causing injury or death.	Poor recovery of rare and endangered species habitat.	Violation of Habitat Management Plan and Endangered Species Act.	Would take from 8-10 months to clear ranges. Probably could not be implemented because of failure to comply with Endangered Species Act.	$4,500/acre

* Cost figures are approximate only and could vary as much as 30%.

How Well Did Each Method Satisfy The Criteria?

The following table provides a summary of how well each clearance method did in satisfying these criteria.

Alternative Method	Effectiveness					Implementability	Approx. Cost *
	Clearance to Bare Ground	Protection of Public Health & the Community	Protection of Workers During Implementation	Protection of the Environment	Compliance with ARARs		
Prescribed Burns	Achieves required vegetation clearance. Fire would take approximately 2 days, once climatic conditions were acceptable.	Air emissions comparable to typical agricultural or wildland prescribed burn (see page 9).	Burning would be conducted using aerial methods, so workers do not have to enter high explosives area. Some ground crews would be present at a safe distance and at air sampling or meteorological stations during the fire.	Beneficial for restoration of rare and endangered species habitat.	Will likely meet all state and federal ARARs.	Implementable if approved by regulatory agencies.	$4,000/acre
Animal Grazing	Animals are selective in what they eat and may not clear vegetation sufficiently for workers to see the ground. Goats are not capable of removing vegetation greater than 4 feet in height, so taller vegetation would still require cutting.	Insignificant air emissions, noise or dust.	High risk of injury or death to animals and to goat herders, herd dogs, and workers who must enter high explosives area to move the fence and to provide water.	Animals would eat rare and endangered plants, and the habitat is unlikely to be restored to a healthy and diverse state. Increased release of nitrogen from animal waste would encourage the growth of non-native weeds that compete with rare and endangered plants.	Violation of Habitat Management Plan and Endangered Species Act.	Would require more than 12 months to clear. Has not been used where there are rare and endangered species, ordnance or explosives, or this thickness of vegetation. Probably could not be implemented because of failure to comply with Endangered Species Act.	$650/acre
Herbicides	Although it will kill vegetation, it would not remove it, and the dense shrub canopy would remain, without leaves. Fallen leaves would cover the ground and obscure unexploded ordnance that may be present.	Some public exposure to potentially harmful herbicides. Herbicides from aerial application may drift into non-target area. Minimal noise or dust.	Applied from air—minimal worker exposure.	Herbicides cannot be applied selectively from air—would kill rare and endangered species along with targeted vegetation. Could prevent growth of any plants for up to several years.	Violation of Habitat Management Plan and Endangered Species Act.	Herbicides could not be safely applied by ground due to the presence of unexploded ordnance. Probably could not be implemented because of failure to comply with Endangered Species Act.	$1,200/acre

* Cost figures are approximate only and could vary as much as 30%.

Which Alternatives Were Eliminated During Screening?

Three alternatives were eliminated during the screening analysis for the reasons shown below:

Alternative Eliminated	Reasons for Elimination
 Animal Grazing	Would not eliminate woody vegetation, so additional clearance would be required before cleanup could occur. Negative impact on rare habitat.
 Herbicide Application	Would not eliminate woody vegetation, so additional clearance would be required before cleanup could occur. Negative impact on rare habitat.
 Remotely-Operated Mechanical Cutting	Has not been tested or used in comparable conditions (with ordnance and explosives present, or on Fort Ord terrain). Not feasible for short-term action.

What Alternatives Are Still Being Considered?

The Army is now completing a more detailed evaluation of the three remaining alternatives that will be summarized in the Interim Action Remedial Investigation/ Feasibility Study. The three remaining alternatives are:

Alternative 1: No Action

Alternative 2: Manual or Mechanical Vegetation Clearance

Alternative 3: Prescribed Burning

Which Alternative Does the Army Prefer?

The Draft Interim Action Remedial Investigation/Feasibility Study recommends prescribed burning for the following reasons:

- Prescribed burning is the most effective method of clearing vegetation and providing visibility for explosives—all methods of cutting leave chips and other debris that block surface visibility for workers.
- Manual or mechanical clearance poses very high risks for workers who would need to enter areas containing dangerous high explosives.
- Manual or mechanical clearance would harm rare and endangered species habitat and would not be in compliance with the Endangered Species Act.
- Cost is not a significant factor in choosing between the alternatives.

How Will the Final Decision Be Made?

Under an agreement between the Army and the federal and state regulators, the final decision will be made jointly by the three agencies (Army, U.S. Environmental Protection Agency, California Department of Toxic Substances Control) involved in cleanup of the ordnance and explosives. When making this decision, the agencies will consider the criteria laid out in the National Contingency Plan.

The National Contingency Plan, the federal regulations that govern clean-up programs, specifies nine criteria that must be considered when evaluating a course of action:

1) Overall protection of human health and the environment
2) Compliance with applicable or relevant and appropriate requirements (ARARs)
3) Long-term effectiveness and permanence
4) Reduction of toxicity, mobility, and volume
5) Short-term effectiveness
6) Implementability
7) Cost
8) State acceptance
9) Community acceptance

The Air Emissions Study

What was the Air Emissions Study?

There are residents in the Monterey Bay area who are concerned that smoke from fires at Fort Ord will contain dangerous pollutants. They point out that fires will trigger detonations of unexploded ordnance and explosives, putting emissions from these detonations into the smoke that will reach nearby residents. They believe that the amount and contents of these emissions will pose a health hazard to residents of the area.

Prescribed burns will trigger some detonations of explosives, and some emissions will be released into the air. But do these additional emissions pose a threat to human health?

Nobody is arguing that being exposed to smoke is good for people. The Army has developed a smoke management program to minimize exposure to smoke. But people with known respiratory problems might, as a precautionary measure, want to leave the area for a few days if burns occur. However, prescribed burns are a normal occurrence in California. As recently as September 2001 there was a prescribed burn of 1500 acres in Monterey County.

Want More Detail?

The following pages provide an overall summary of the air emissions study.

The report is available at www.FortOrdCleanup.com.

The real question becomes: Is a prescribed burn on land where there is unexploded ordnance or explosives somehow different or a greater threat to human health than a prescribed burn on land where there are no explosives?

This is precisely the question that was addressed in a recent study by the Army of the air emissions released by detonation or burning of ordnance and explosives. The study was conducted in consultation with the U.S. Environmental Protection Agency, Region IX, and the California Department of Toxic Substances Control. The California Air Resources Board and the Monterey Bay Unified Air Pollution Control District were also involved, reviewing the draft study and providing written comments to the Army; and they will continue to be involved in discussions with the other agencies and the Army.

The study addressed these questions:

Would prescribed burns on lands at the former Fort Ord where there is unexploded ordnance and explosives produce:

(1) Air emissions that are significantly different—in either type or quantity—from those that would be generated by a prescribed burn on the same lands if no unexploded ordnance or explosives were present; or

(2) Air emissions from incidental detonation that are significant in magnitude compared to air emissions from a fire on land where there is no unexploded ordnance or explosives?

Capsule Summary...

- The Army initially evaluated the following vegetation removal alternatives:
  - No Action
  - Manual, mechanical or remotely-operated clearance
  - Prescribed burns
  - Animal grazing
  - Herbicide application
- The No Action alternative does not remove vegetation, so cleanup would not occur if this alternative were chosen.
- Animal grazing, herbicide application, and remotely-operated clearance have been eliminated from consideration. Animal grazing and herbicide application remove only leaves, not branches and trunks, and have harmful effects on rare habitat. Remotely-operated clearance is at the research and development stage, and has never been used in conditions such as those at Fort Ord. In addition, workers would need to enter the high explosives areas to repair machines whenever they were disabled by explosives.
- Manual or mechanical clearance alternatives have three fundamental problems:
  - Workers have to enter high explosives areas, subjecting themselves to unacceptably high risks of injury or death.
  - Central Maritime Chaparral, the rare habitat at Fort Ord, has difficulty growing back after it has been cut.
  - These methods would not comply with the Endangered Species Act.
- Prescribed burns will likely meet all applicable state and federal rules and regulations.

How Was the Air Emissions Study Conducted?

For the past ten years, the U.S. Department of Defense has been closing down a number of former military installations. There are environmental cleanup programs at virtually all of these installations, in preparation for eventual transfer of the land for other uses. The U.S. Department of Defense funded a number of field studies to identify and quantify the pollutants released into the air from detonating or burning ordnance and explosives.

These air emissions detonation studies are sometimes referred to by the public as "the BangBox studies" because many of them were conducted inside a chamber, called a "BangBox."

The U.S. Environmental Protection Agency did an analysis of the results of the BangBox studies. Of the more than 275 chemical compounds included in the BangBox studies, most were not detected in the air of the BangBox. Among the compounds that were not detected were compounds known to be contained in the exploded material. These materials may either have been present in such small quantities that they were not detected, or might have been completely consumed in the explosion.

Eighty-three (83) compounds were detected. The majority of these compounds are non-hazardous and many are found normally in the air. But some of the compounds are pollutants that justify careful research.

Opponents of prescribed burns at Fort Ord have commented that the BangBox studies evaluated explosives found at military installations all over the country, and did not take into

What's a BangBox Study?

The BangBox is a chamber specifically built to withstand explosions and burning of ordnance and explosives or other energetic materials. The BangBox contains all the emissions from these explosions, permitting researchers to take air samples that can then be analyzed to determine the kind and quantity of each compound in those air emissions.

account the specific mix of ordnance and explosives found at Fort Ord.

To address these concerns, the Army began a careful study of Ranges 43-48 at Fort Ord. These former training ranges were selected because they are known to be areas where a wide variety of highly explosive pyrotechnic materials were used and large concentrations of unexploded items remain on the ground.

The researchers addressed the following questions:

How large are the emissions from burning vegetation?

Researchers first estimated what emissions would be generated by a fire at Ranges 43-48 if there were no explosives present. Based on studies conducted by CSU Monterey Bay researchers, they estimated the total amount of vegetation present in each of five age classes (3 years, 5 years, 10 years, 15 years, and 30+ years). Using aerial photographs, researchers were able to determine the acreage totals for each chaparral age class, and for grasslands. Researchers based their estimates of emissions that would result from fires upon studies conducted by several agencies, including the U.S. Forest Service, the California Air Resources Board, and the U.S. Environmental Protection Agency.

What are the air emissions that would result from burning on land where there is ordnance and explosives?

Researchers determined what types of ordnance might be present at Ranges 43-48 by examining several decades of available records. They reviewed information about what types of targets were used for training, what types of weapons were used in the training, and how much ordnance has been found when firing ranges at other portions of Fort Ord have been cleared. Because many of the records were old and inexact, researchers developed very high estimates for each type of ordnance—the highest amounts of ordnance the researchers believe could be found at these ranges.

Emissions from ordnance and explosives could result from three distinct processes:

- Leaching of metals into the soil, where they are taken up by vegetation and released as air emissions when the vegetation is burned.
- Detonation of the ordnance or explosives during a fire.
- Vaporization of structural components (e.g., shell casings).

Each of these three processes was studied as part of this investigation. However, researchers concluded that metal components could not be vaporized, because temperatures would not be high enough.

Estimates were developed for air emissions from metals leached into the soil and released during a fire, and detonation during a fire.

How much of each individual ordnance component would be put into the air?

When ordnance and explosives detonate they put both combustion products (the gases or fumes released during a fire) and particulates (tiny pieces of chemical compounds or metals) into the air. Using existing references, researchers calculated an emission rate for each combustion product and particulate component. By multiplying this emission rate times the total estimated mass of explosive material, researchers developed an estimate of how much of each pollutant would be released to the air. These are upper-bound figures—the highest reasonable estimate for each pollutant.

How do the emissions from burning vegetation compare with emissions from ordnance and explosives?

The table on the next page shows the relative magnitude of the ordnance-related emissions from incidental detonation compared to emissions of the same pollutant from burning of the vegetation on Ranges 43-48. These comparisons show the ordnance emissions as a percentage of vegetation emissions.

Some substances that would be put into the air by a fire on land with explosives do not normally occur in vegetation, so there were not any emission factors that could be used to make comparisons with vegetation burning, and these were not included in the table. However, these substances were included in subsequent steps that compared anticipated concentrations of these substances in the air with regulatory screening levels.

Researchers concluded that the highest reasonable estimates that could be expected for combustion products and most volatile organic compounds (VOCs) resulting from ordnance and explosives are less than one one-thousandth (0.1%) of the emissions generated by burning vegetation alone. This means: for each ounce of emissions due to ordnance and explosives, there would be more than 62.5 pounds of emissions from burning of vegetation.

Researchers concluded that the highest reasonable estimate of the emissions of particulate metals that could be released by detonation of ordnance and explosives was one-tenth the emissions of particulate metals from vegetation burning. This means: for each ounce of metal emissions due to ordnance and explosives, there would be nearly one pound of metal emissions from burning of vegetation. The one exception was Beryllium, for which ordnance emissions were 45% of that from vegetation.

Are the additional emissions from ordnance and explosives a human health risk?

In order to compare the emissions from ordnance and explosives with applicable screening levels, researchers are currently employing a model, approved by the US Environmental Protection Agency, to convert the amounts that were emitted into estimates of concentrations in the air. These concentrations in air will then be compared to safe concentrations, or "screening concentrations," formulated by local, state and federal agencies, such as U.S. EPA, the California Office of Environmental Health Hazard Assessment, and the Monterey Bay Unified Air Pollution Control District.

Preliminary results indicate that worst case pollutant concentrations from ordnance or explosives detonated incidentally during a fire will be substantially less than emissions from the burning of chaparral alone and well below screening levels. The Army anticipates that Version 1 of this study will be available

An example of a fuelbreak to help control a fire.

Preliminary Comparison of Ordnance Emissions to Vegetation Emissions

Air Contaminant	Ordnance Emissions as a % of Vegetation Emissions
Combustion Products and VOCS	
Carbon Monoxide	0.002%
Carbon Dioxide	0.002%
Nitrogen Oxides (as NO2)	0.010%
Non-Methane Hydrocarbons	0.001%
Particulate Matter (> 10 microns)	0.089%
1,3 Butadiene	0.000%
n-Hexane	0.001%
Methyl Chloride	0.000%
Benzene	0.001%
Toulene	0.000%
Dioxin/Furan TEQ	1.465%
Metals	
Aluminum	2.366%
Antimony	5.383%
Arsenic	1.1855
Beryllium	45.344%
Cadmium	6.861%
Chromium	6.451%
Copper	8.191%
Lead	10.871%
Mercury	0.680%
Nickel	2.764%
Selenium	1.570%
Silver	8.745%
Zinc	8.164%

Is Smoke Good For You?

The Range 43-48 air emissions study concluded that the additional health risks from a fire on land where there is unexploded ordnance or explosives are insignificant. But the study did not evaluate the health risks of smoke generally.

Health experts agree that there can be health effects from exposure to smoke, particularly for people with respiratory problems.

The dilemma for decision makers is that none of the feasible alternatives is without health risks. Leaving the explosives in place would pose a very serious health and safety threat. All the vegetation clearance alternatives involving manual or mechanical cutting—the principle alternative to prescribed burns—run very high risks that workers doing the cutting will accidentally detonate explosives, causing serious injury or death.

Decision makers must also take into account:

- Prescribed burns are a legal and normal land management and agricultural practice in California.
- Natural or accidental fires are likely to occur if there are no prescribed burns. If the amount of brush is allowed to grow unchecked, such a fire would be much larger (with a larger amount of uncontrolled smoke) than a prescribed burn. In addition, fire fighters could not enter the land due to the high explosives, so there is considerable danger the fire could not be controlled within the boundaries of the former Fort Ord.
- If prescribed burns are conducted at Fort Ord, they would be conducted under climatic conditions that would minimize smoke, and the Army would pay relocation costs.

about the time of Symposium 2. Additional information, and modeling results, will most likely be presented at Symposium 2.

What about people who are worried about the impacts of prescribed burns upon their health?

The Army has not yet made a final recommendation on which vegetation clearance method it will use, nor have the regulatory agencies said they would accept prescribed burns, if that is what the Army recommends. That decision will be made early next year (see schedule on page 3).

The Army believes—as a result of the studies described here—that a prescribed burn at Fort Ord could produce health risks that, for most people, are similar to those from a prescribed burn elsewhere in Monterey County. Some individuals cannot tolerate smoke from any source; these people might be affected by a prescribed burn at Fort Ord.

Even though the Army will make every effort to minimize it, some smoke will reach people downwind of Fort Ord. The Army has decided that—if a burn is conducted—it will pay for temporary relocation costs of anyone in the Monterey Bay area (including areas such as the Highway 68 corridor and Salinas) who is worried about the impact of smoke upon their health. A summary of the relocation program is provided on page 13.

If There Were Burns, How Would They Be Conducted?

Capsule Summary...

- Researchers studied the air emissions that would result from prescribed burns on Ranges 43-48, former training ranges where there is a large quantity of dangerous high explosives.
- Researchers compared the amounts of pollutants put into the air from a prescribed burn in Ranges 43-48 had no explosives on the land, versus a prescribed burn on Ranges 43-48 with explosives.
- The preliminary conclusion is that air emissions from incidental detonation and possible incidental burning of ordnance and explosives during a prescribed burn on Ranges 43-48 will be a minor fraction of the emissions that result from burning of vegetation alone.
- Preliminary estimates of pollutant concentrations in air resulting from incidental detonation or possible incidental burning of explosives are much lower than any of the health-protective screening levels established by the regulatory agencies.
- The results of these studies are "preliminary," while researchers address questions about the study methodology that have been raised by the California Air Resources Board.

How Would the Army Minimize Smoke?

If there are prescribed burns, the Army will be looking for ideal climatic conditions to ensure that the smoke rises and disperses with minimal impact to the public and surrounding communities.

What are the ideal conditions? The sky must be clear of low clouds. In the early morning, the winds need to either be calm, or blowing lightly towards the ocean. The burn will be started near sunrise, to allow the majority of the burning to be completed by the time the afternoon sea breeze begins. The morning burn will loft the smoke as high as possible, so it will disperse before the sea breeze starts to blow the smoke back towards shore. The smoke will be visible, and there will be some smell, but the bulk of the smoke will blow away at high altitudes.

Rather than a series of small fires, the burn will occur in just 1-2 days. The reason is that a very intense fire makes the smoke rise higher, so it is less likely to impact nearby residents and also does a more complete job of clearing vegetation.

The best time for burning usually occurs in a "window" between August and January. These months are optimal because there are more clear days and the vegetation is the driest then as well.

The Army can base its forecasts of ideal conditions on considerable meteorological information. The Army has two remote weather stations near the proposed burn area at Ranges 43 and 46. The Bureau of Land Management has a remote weather station just to the east of the burn area on Wildcat Ridge. All three airports in the immediate area—Marina to the North, Monterey to the southwest, and Salinas to the east, report hourly weather information. The Naval Post Graduate School has an atmospheric profiler and surface weather site immediately to the northwest. The atmospheric profiler provides information on wind and temperature up to 5,000 feet. As a result, the Army has access to both historical and current weather information, 24 hours a day, 7 days a week.

How Would the Burn Be Controlled?

Long before a burn would actually occur, a team of specialists would develop a Burn Plan that looks at specific site conditions and the staff and organization required to conduct a safe burn. This plan would be reviewed by a number of local and state fire organizations to ensure it is fully adequate.

Before the fire, the team would be sure that there are cleared roadways and fuel breaks around the perimeter of the fire. In addition, the team would treat a strip 100 feet wide outwards from the containment roads with fire retardant. The 8,000 acre Multi-Range Area (which includes Ranges 43-48) is subdivided into smaller areas—called "defensible polygons"—that are surrounded by roads. The areas alongside these roads have been cleared, providing a 45-foot wide fuel break. These roads can also be treated with foam before a fire reaches them.

The fire is controlled using helicopters. Firefighters cannot be on the roads surrounding the burn once the fire has started, because they could be exposed to explosives detonated by the fire. The core decision making team includes: the Army Fire Department Chief and the Burn Contractor's Incident Commander, who will be above the fire in a helicopter seeing and controlling the overall management of the fire; a Fire Behavior Analyst who will be tracking the fire on both live video and infrared feeds; an Ignition Specialist, responsible for starting the fire; and a Meteorologist, who will be tracking the weather and smoke dispersion conditions moment by moment. The helicopters are equipped with infrared technology that allows the core team to "look through" the smoke and detect any fires that start outside the containment area. These fires can then be suppressed immediately.

An agricultural prescribed burn.

Temporary Relocation Program During Prescribed Burns at the Former Fort Ord

How long will the burns last?

The burns will last 1-2 days maximum, but smoke may linger in the air for another day or two.

What does relocation mean?

If you choose, during a prescribed burn you and your family members can stay with relatives or friends or stay in a hotel or motel for 2-3 days until the smoke has blown away. The Army will pay for reasonable costs associated with this move.

How do I qualify for relocation?

You will need to fill out paperwork before the Army can pay relocation expenses. We'll help you fill out the forms if you call the Environmental Information Hotline at (800) 852-9699. It is best to do this BEFORE any prescribed burns that might require relocation. That way there won't be any delays in getting relocation approved. If you fill out the paperwork but then decide you don't want to relocate for a particular burn, that's OK too.

What if I have health problems during a burn?

If it is an emergency, call 911 or your health provider directly.

Will the Army pay for my medical expenses?

The Army has an established procedure for filing claims for legitimate medical expenses. Call the Environmental Information Hotline, 800-852-9699, for help in completing the forms.

How will I be notified before the prescribed burn?

Once you have completed an application for relocation benefits, the Army will put you on a special notification list and will let you know when a prescribed burn is scheduled.

How do I move?

Normally you would use your personal transportation to move members of your household, personal belongings and any medications necessary for two or three days. If you don't have a car, ask a friend or relative to help. If this is unworkable, call the hotline so we can help you make other arrangements.

Where will I be relocated?

You can stay with a relative or friend or you can stay in a hotel or motel. The Army has made arrangements with some hotels or motels to pay them directly. You must obtain Army approval before you make any commitments to other hotels/motels or to pay relatives or friends. If you choose to make your own arrangements, the Army will reimburse the room rate up to federal lodging allowance (currently $93 during tourist season) per family. If you choose to stay with relatives or friends, the Army will pay $25.00 per night. When you stay at any place other than the Army-provided hotels/motels, you will need to pay the hotel directly.

Which of my relocation expenses will be covered?

In general, the Army will pay or reimburse you for all reasonable costs associated with your relocation. This includes meals, lodging and transportation costs. The cost of meals and lodging is subject to federal per diem allowances that govern all federal travel. The meal and lodging costs are updated annually. Currently the maximum lodging costs the federal government will pay for in the Monterey area is $75 (off-season) and $93 (tourist peak season). The meals allowance is currently $42. Children under age 12 receive 50% of the meal allowance.

Which of my expenses will not be covered?

You will NOT be reimbursed for:

- Your rent, mortgage, or the utilities on your home during your temporary relocation, as these payments are not considered to be additional costs caused by your relocation, even though you will not be living in your home.
- The cost of temporary housing beyond the date on which your temporary relocation period ends;
- Expenses related to accidents, injuries, or illnesses that you may experience during your temporary relocation period;
- Duplicate benefits—expenses that have already been paid by someone else, such as a social welfare agency;
- Expenses for temporary housing searches; and
- Other expenses the Army has not approved.

What happens when the prescribed burn is over?

Ordinarily the relocation benefits end two days after the prescribed burn is started, but the benefits will be extended if the Army determines that a longer stay is needed.

If you do not leave your temporary housing by the time indicated on the notice from the Army, you must pay any charges for the extra time.

Who do I call if I have questions?

For general questions, call the Environmental Information Hotline at (831) 242-7383 or (800) 852-9699.

Put Your Name On Our Mailing List

To receive future information about Fort Ord cleanup plans and activities, please clip and return this coupon to Community Relations Office, Environmental and Natural Resources Management, P.O. Box 5004, Presidio of Monterey, CA 93944-5004, or fax to 831-393-9188. You can also contact us via email at: cqc@redshift.com to be placed on the community relations mailing list.

(please print or type)

Name: _____

Address: _____

City/State/Zip: _____

Email (optional): _____

Special interests:

- ☐ Groundwater Contamination
- ☐ Ordnance and Explosives Cleanup
- ☐ Habitat Preservation
- ☐ Property Transfer
- ☐ Prescribed Burning
- ☐ Other: _____

Additional Information About The Cleanup Of Fort Ord

The Army is responsible for ensuring cleanup of the former Fort Ord, but it must do so in a manner that complies with federal and state laws and under the supervision of federal and state environmental regulatory agencies. At Fort Ord, the cleanup is supervised by the U.S. Environmental Protection Agency (EPA), the California Department of Toxic Substances Control (DTSC), and the Regional Water Quality Control Board (RWQCB).

To expedite cleanup at Fort Ord, the three regulatory agencies signed an agreement with the Army about how the agencies would manage the program and the manner in which any disagreements would be settled. Under this agreement, each agency has assigned a representative to a Base Cleanup Team (BCT). This team makes the day-to-day management decisions about the cleanup program. When there are disagreements between the agencies, policy-level managers from each of the agencies meet to resolve differences.

These three regulatory agencies, whose job it is to protect public health and safety, are intimately involved with virtually all of the cleanup decision making at the site. Contacts for each of the participating agencies in Fort Ord's cleanup are listed below.

United States Environmental Protection Agency

John Chesnutt
BCT Member
415-972-3005

Viola Cooper
Community Involvement Coordinator
415-972-3243
800-231-3075

California Department of Toxic Substances Control

Rizgar Ghazi
BCT Member
916-255-3610

Linda Janssen
Public Participation Specialist
916-255-6683

California Regional Water Quality Control Board

Grant Himebaugh
BCT Member
805-542-4636

Fort Ord Cleanup Website

www.FortOrdCleanup.com

United States Army—Presidio of Monterey

Gail Youngblood
BCT Member
831-242-7924

Kevin Siemann
Ordnance & Explosive Program Manager
831-242-7919

Lyle Shurtleff
Community Relations
831-393-9691

Melissa Hlebasko
Community Relations Program Coordinator
831-393-1284
800-852-9699

Fort Ord Reuse Authority

831-883-3672

Information Repositories

- Fort Ord Administrative Record
- Seaside Library
- Ord Military Community Library
- California State University, Monterey Bay Library

For assistance in finding information of interest to you please contact Tina Fischl at: 831-393-9186 or write to Community Relations, P.O. Box 5004, Presidio of Monterey, CA 93944-5004

Symposium #2 Agenda ♦ November 14, 2001

1:00 - 1:20 **Welcome, Opening Comments**

1:20 - 1:30 **Overview from Symposium #1**

1:30 - 1:45 **Evaluation of Vegetation Removal Alternatives**
- ♦ What are the alternatives?
- ♦ How are they are being evaluated?
- ♦ What were the results of the Range 43-48 study?
- ♦ What is the IA RI/FS process/schedule?

1:45 - 2:15 **If there were Prescribed Burns, how would they be conducted?**
- ♦ What is included in a fire prescription?
- ♦ How can smoke be mitigated?
- ♦ What is the Army's relocation plan?
- ♦ How would the public be notified?

2:15 - 2:45 **Panel Discussion: What needs to be included in fire planning**

2:45 - 3:05 **Break**

3:05 - 3:30 **Air Emissions Study for Ranges 43-48**
- ♦ How was the study conducted?
- ♦ What were the conclusions of the study?
- ♦ How was the study evaluated by other agencies?
- ♦ What is the applicability of these findings for the Interim Action Remedial Investigation/Feasibility Study?

3:30 - 4:00 **"Meet the Press" - Reporters question the experts**

4:00 - 5:00 **Questions & Answer Period**
- ♦ Alternating Q&A - 3x5 card/floor microphone/3x5 card, etc.
- ♦ 3x5 cards are sorted by community organization volunteers
- ♦ Microphone questions are limited to one question with one follow-up question—however, individuals can return to the line after others have had an opportunity to ask their questions.

Summary continued from back cover...

- The preliminary conclusion is that air emissions from incidental detonation and burning of ordnance and explosives during a prescribed burn on Ranges 43-48 will be a minor fraction of the emissions that result from burning of vegetation alone.
- Preliminary estimates of pollutant concentrations in air resulting from incidental detonation or possible incidental burning of explosives are much lower than any of the health-protective screening levels established by the regulatory agencies.
- The Army believes—as a result of the studies described here—that a prescribed burn at Fort Ord could produce health risks that, for most people, are similar to those from a prescribed burn elsewhere in Monterey County.
- The Army has decided that—if a burn is conducted—it will pay for temporary relocation costs of anyone in the Monterey Bay area (including areas such as the Highway 68 corridor and Salinas) who is worried about the impact of smoke upon their health.
- If there are prescribed burns, the Army will be looking for ideal climatic conditions to ensure that the smoke rises and disperses with minimal impact to the public and surrounding communities.
- Long before a burn would actually occur, a team of specialists would develop a Burn Plan that looks at specific site conditions and the staff and organization required to conduct a safe burn. This plan would be reviewed by a number of local and state fire organizations to ensure it is fully adequate.

Un Resumen de lo Que Hallará en la Interior...

- La conclusión preliminar es que las emisiones derivadas de las detonaciones incidentales y de la quema de los pertrechos militares y explosivos que se podrían producir durante una quema prescripta en las Zonas 43-48 representaría una fracción menor de las emisiones que se derivarían de la quema de vegetación solamente.
- Las estimaciones preliminares de las concentraciones de contaminantes en el aire producto de la detonación incidental o de las posibles quemas incidentales de explosivos son mucho menores que cualquiera de los niveles de detección protectores de la salud establecidos por las agencias de regulación.
- El Ejército considera—como consecuencia de los estudios que se describen en este informe—que utilizar el método de quema prescripta en Fort Ord podría producir riesgos para la salud similares a los que produciría una quema prescripta en cualquier otro terreno del Condado de Monterrey.
- El Ejército decidió que—de realizarse la quema—asumirá el costo de la reubicación temporaria de cualquier persona que resida en la zona de la Bahía de Monterrey (con inclusión de zonas tales como el corredor de la Autopista 68 y Salinas) y que estuviera preocupada por el impacto que el humo pudiera llegar a tener en su salud.
- En caso de efectuarse la quema prescripta, el Ejército esperará a que las condiciones climáticas sean las ideales para garantizar que el humo se eleve y se disperse con un mínimo impacto en el público y en las comunidades aledañas.
- Mucho antes de que se produzca efectivamente la quema, un equipo de especialistas desarrollará un Plan de Quema que analice las condiciones específicas del sitio, el personal y la organización que se requerirán para ejecutar una quema segura. Dicho plan será revisado por varios cuerpos de bomberos locales y estatales para asegurar que sea totalmente apropiado.

(Please complete and return the registration form to secure your attendance at the Symposium)

Symposium #2 Registration Form

Please register me to attend Symposium #2 on November 14, 2001 at 1:00 p.m. at the Monterey Conference Center. There is no cost to attend the forum.

Name _____

Address _____

City/State/Zip _____

Phone _____

Organization (if any) _____

Title (if any) _____

Return your completed registration form to: Community Relations Office, Environmental and Natural Resources Management, P.O. Box 5004, Presidio of Monterey, CA 93944-5004 or fax to 831-393-9188. You also can register to attend through our website at www.FortOrdCleanup.com (go to "News," "Symposium #2). For more information, or directions to Symposium #2, contact Lyle Shurtleff at 831-393-9691.

A Summary of What You'll Find Inside...

- The Army conducted an evaluation of alternative vegetation clearance methods for Ranges 43-48, Range 30A, and OE 16, the parcels of land that are the highest priority for cleanup.
- The alternatives that were evaluated included: No Action, Manual Clearance, Mechanical Clearance, Remotely-Operated Mechanical Clearance, Prescribed Burns, Herbicide Application and Animal Grazing.
- The Interim Action Remedial Investigation/Feasibility Study recommends prescribed burning for the following reasons: It is the most effective method of clearing vegetation and providing visibility for explosives; manual or mechanical clearance poses very high risks for workers who would need to enter areas containing dangerous high explosives; and manual or mechanical clearance would harm rare and endangered species habitat and would not be in compliance with the Endangered Species Act.
- No final decision has been made. The final decision will be made jointly by the three agencies (Army, U.S. Environmental Protection Agency, and the California Department of Toxic Substances Control) involved in cleanup of the ordnance and explosives. The Army will publish a Proposed Plan in March 2002. The public will be invited to comment on the Plan during public meetings.
- The Army conducted a study to determine whether prescribed burns on lands at the former Fort Ord where there is unexploded ordnance and explosives would produce: (1) Air emissions that are significantly different—in either type or quantity—from those that would be generated by a prescribed burn on the same lands if no unexploded ordnance or explosives were present; or (2) Air emissions from incidental detonation that are significant in magnitude compared to air emissions from a fire on land where there is no unexploded ordnance or explosives?

Continued on inside back cover (page 15)

Un Resumen de lo Que Hallará en la Interior...

- El Ejército realizó una evaluación de métodos alternativos para despejar vegetación en las zonas 43-48, 30 A y OE 16, lotes que representan las principales prioridades de limpieza.
- Las alternativas que se evaluaron fueron: Ninguna acción, Limpieza manual, Limpieza mecánica, Limpieza mecánica operada a control remoto, Quemas prescriptas, Aplicación de herbicidas y Pastoreo de animales.
- La Investigación Provisoria de Acciones de Remediación / Estudio de Factibilidad recomienda la utilización de quemas prescriptas por las siguientes razones: se trata del método más efectivo para despejar vegetación y ofrecer visibilidad para explosivos; la limpieza manual o mecánica encierra altos riesgos para los trabajadores quienes deberán ingresar en zonas en las que existen peligrosos explosivos de alto poder; y la limpieza manual o mecánica también dañaría el hábitat de las especies exóticas y en peligro de extinción, además de no cumplir con lo que dispone la Ley de Especies en Peligro de Extinción.
- Aún no se ha adoptado una decisión definitiva, la que será tomada conjuntamente por las tres dependencias (el Ejército, la Agencia de Protección Ambiental, y el Departamento de Control de Sustancias Tóxicas de California) involucradas en la limpieza de pertrechos militares y explosivos. Las dependencias publicarán el Plan Propuesto en marzo de 2002. El público será invitado a audiencias públicas donde podrá expresar sus comentarios y opiniones sobre el Plan.
- El Ejército realizó el estudio para determinar si las quemas prescriptas en los terrenos donde anteriormente se emplazaba Fort Ord y donde existen depósitos de pertrechos militares y explosivos, podrían llegar a producir: (1) emisiones que resultaran significativamente diferentes—ya sea en tipo o en cantidad—de las que hubieran sido generadas por una quema prescripta de los mismos terrenos de no haber existido en ellos pertrechos militares o explosivos; o (2) emisiones producto de la detonación incidental que fueran de una magnitud importante en comparación con las emisiones producidas por cualquier incendio en terrenos en los que no existieran pertrechos militares o explosivos.

Para obtener una copia completa del boletin de la comunidad #1, contacte (800) 852-9699.

Fort Ord Environmental Cleanup
Community Relations
P.O. Box 5004
Presidio of Monterey, CA 93944-5004

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